UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,756	12/29/2000	Robert A. Marshall	062891.0451	5059

7590 01/23/2006	EXAMINER
Baker Botts L.L.P. Suite 600 2001 Ross Avenue Dallas, TX 75201-2980	JAMAL, ALEXANDER

ART UNIT	PAPER NUMBER
2643	

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
	09/751,756	MARSHALL ET AL.
Office Action Summary	Examiner	Art Unit	
	Alexander Jamal	2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>01 December 2005</u>.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>26</u> is/are pending in the application.

    4a) Of the above claim(s) <u>4,15</u> is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _____ is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Based upon the submitted amendment (entered via RCE) (10-27-2005), the examiner

notes that claims 4,15 have been cancelled and claims 1,11,16,18,19 have been amended.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

3.   **Claim 13** rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing

to particularly point out and distinctly claim the subject matter which applicant regards as the

invention. The claim recites a method but the claim appears to be cutoff and it is not clear what

the demodulated data portion comprises. For the purposes of examination, examiner assumes the

claim recites that the requantizing comprises "determining a constellation associated with each

bit of data in the modulated data portion and resetting the value of that bit to the value of the

constellation" as per the amended limitation of claim 11.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
such that the subject matter as a whole would have been obvious at the time the invention was made to a person
having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
manner in which the invention was made.

5.   **Claims 1,3-6,11-17** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers

(6236664), and further in view of Liu (6088385).

As per **claim 1,** Erreygers discloses a method of providing greater reach for a

DSL signal comprising a step of receiving, processing, then transmitting an incoming

DSL signal including a data signal (ABSTRACT). Erreygers further discloses that the

repeater comprises two ADSL transceivers (Fig. 3: Col 5 lines 40-60) to process the bi-

directional data signal. However, Erreygers does not specify that the transceivers

perform demodulating, requantizing, modulating, and then amplifying the data signal.

Liu teaches an ADSL transceiver with a flexible and scaleable rate (ABSTRACT,

Col 1 lines 30-45). Liu's transceiver performs the functions of demodulating received

analog signals and producing the original data stream 201 (Fig. 2). It also takes the

received digital data stream and quantizes then modulates the stream to produce a DSL

signal (output of block 230). Examiner reads the demodulation of the data signal as

'conditioning the data signal to aquire underlying data' because the original data stream

is recovered and used to requantize the signal. With two transceivers in series in the

repeater disclosed by Erreygers, the repeater will performs the functions of demodulating,

requantizing, modulating, and then amplifying the received signal (in both directions). It

would have been obvious to one of ordinary skill in the art at the time of this application

to utilize Liu's transceiver for each of the transceivers in series disclosed by Erreygers for

the purpose of implementing flexible and scaleable transceivers in the receiver that may

have greater compatibility with various types of ADSL transceivers at either the CPE side

or central office side of the network.

As per **claim 11**, claim rejected for same reasons as rejection of claim 1.

As per **claims 16,17**, claim rejected for same reasons as rejection of claim 1.

Erreygers and Liu disclose the means (the transceiver) to perform the method of the claim

1 rejection.

As per **claims 3,12**, Liu discloses that the ADSL transceivers perform the steps of

digitizing the data, using an FFT to demodulate the data in the Frequency bins

(subchannels in a DMT system) (Col 6 lines 1-10, 34-54) (Col 8 lines 1-10). Since the

demodulation is setup to only demodulate data from specific sub-channels (bins), the data

outside the bins is inherently discarded.

As per **claim 13**, claim 13 rejected for same reasons as claim 1. The decoded data

is recoded (requantized, each bit set to a value in a constellation).

As per **claims 5,14**, Erreygers, in view of Liu discloses that the DSL repeater

decodes the data using frequency bins and an FFT (as per rejection of claim 3) and then

recodes the data into frequency bins, and converts the signal to an analog signal (Liu Fig.

2). However, they do not specify using an inverse FFT.

It would have been obvious to one of ordinary skill in the art at the time of this

application to utilize an inverse FFT to recombine the data that was decoded via an FFT

for the reason that the inverse FFT will provide the most efficient, and accurate means to

recombine data that was separated via FFT.

As per **claim 6,** Liu's system requantizes the data in the frequency domain (the

sub-channels) (Col 8 lines 1-15).

6.   **Claims 18-25** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers

(6236664), and in view of Liu (6088385), and further in view of McGhee et al. (6658049).

As per **claim 18,25,** claim 18 is disclosed by Erreygers in view of Liu for the

same reasons as the rejections of claims 1 and 16. However they do not specify the DSL

signal includes a voice signal that is combined (in the repeater) with the amplified data

signal.

McGhee discloses an xDSL repeater system where the DSL signal comprises a

voice and data signal (Col 3 lines 28-30). The voice signal is filtered, and then combined

with the amplified/repeated data signal (Fig. 2). Both the Data and Voice signals are

amplified by the gains of filters 32 and 34 (Fig. 2). It would have been obvious to one of

ordinary skill in the art at the time of this application to provide means to

split/recombine/amplify the voice and data signals after being processed by the repeater

for the purpose of allowing the repeater to be used on DSL lines that contain both data

and voice signals.

As per **claim 19,21,24,** claims rejected for the same reasons as claim 18 rejection.

Additionally, Liu discloses a first signal detector (Hybrid 220 in Fig. 2) (Col 6 lines 9-14)

that detects the incoming DSL signal from the telephone line and applies the outgoing

DSL signal to the line. A first conditioning unit is described in claim 1 rejection.

Erreygers in view of Liu discloses two transceivers in parallel to implement a Bi-

directional repeater (Erreygers Fig. 3) that comprises a second signal detector and

conditioning unit working in the opposite direction as the first signal detector and

conditioning unit.

As per **claim 20,** McGhee discloses high band filter 34 and low band filter 32

(Fig. 2) to separate the voice and data signals.

As per **claims 22,23,** Erreygers, in view of Liu in view of McGhee discloses that

the DSL repeater decodes the data using frequency bins and an FFT (as per rejection of

claim 3) and then recodes the data into frequency bins. The transceiver further comprises

A/D and D/A converters (Liu Fig. 2). However, they do not specify using an inverse

FFT.

It would have been obvious to one of ordinary skill in the art at the time of this application to utilize an inverse FFT to recombine the data that was decoded via an FFT for the reason that the inverse FFT will provide the most efficient, and accurate means to recombine data that was separated via FFT.

7.   **Claims 2,7,8,** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers (6236664), and in view of Liu (6088385) as applied to claim 1, and further in view of McGhee et al. (6658049).

As per **claims 2,7,** Erreygers in view of Liu discloses applicant's claim 1, however they do not specify the DSL signal includes a voice signal that is combined (in the repeater) with the amplified data signal.

McGhee discloses an xDSL repeater system where the DSL signal comprises a voice and data signal (Col 3 lines 28-30). The voice signal is filtered, and then combined with the amplified/repeated data signal (Fig. 2). It would have been obvious to one of ordinary skill in the art at the time of this application to recombine the voice and data signals after being processed by the repeater for the purpose of allowing the repeater to be used on DSL lines that contain both data and voice signals.

As per **claim 8,** McGhee discloses that the first filtered portion of the DSL signal comprises the voice portion in the 0-4 KHz range and the remaining portion (such as approximately 25KHz to 1.1 MHz) is used for the ADSL signal (Col 1 lines 45-60).

8.   **Claims 9,10** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers (6236664) in view of Liu (6088385) as applied to claim 1, and further in view of Fisher (4878232).

As per **claims 9,10,** Erreygers in view of Liu discloses applicant's claim 1.. However, they do not specify that the repeater signals are coupled to the telephone line (both transmit and receive signals) by a balanced, resistive, hybrid bridge.

Fisher discloses using a resistive hybrid bridge to couple transmit/receive data signals to/from a transmission line (ABSTRACT, Fig. 4) (Col 3 lines 25-60). It would have been obvious to one of ordinary skill in the art at the time of this application to implement a resistive hybrid bridge for the bridge specified in Liu as a matter of design choice (for example, resistor based circuits take up less space than inductors).

9.   **Claim 26** rejected under 35 U.S.C. 103(a) as being unpatentable over Erreygers (6236664), in view of Liu (6088385), in view of McGhee et al. (6658049) as applied to claim 19, and further in view of Fisher (4878232).

As per **claim 26,** Erreygers in view of Liu in view of McGhee discloses applicant's claim 19. However, they do not specify that the repeater signals are coupled

to the telephone line (both transmit and receive signals) by a balanced, resistive, hybrid

bridge.

Fisher discloses using a resistive hybrid bridge to couple transmit/receive data

signals to/from a transmission line (ABSTRACT, Fig. 4) (Col 3 lines 25-60). It would

have been obvious to one of ordinary skill in the art at the time of this application to

implement a resistive hybrid bridge for the bridge specified in Liu as a matter of design

choice (for example, resistor based circuits take up less space than inductors).

Response to Arguments

10.   Applicant's arguments filed 10-27-2005 have been fully considered but they are not

persuasive.

As per applicant's arguments (remarks, pages 9-10) that the Erreygers-Liu

combination does not disclose requantizing the data by resetting each bit to a bit of a

constellation, examiner disagrees. Liu discloses that the ADSL transceiver uses QAM to

convert each bit to a complex value (a value in a constellation) before modulating the bits

with a carrier signal (LIU: Col 4 line 60 to Col 5 line 7). When implemented in

Erreygers system, two transceivers will function to bi-directionally requantize the

bidirectional data. Note that Liu's transceiver outputs the recovered data 201 (Liu: Fig.

2). This recovered data would be input to an additional transceiver that would perform

the requantizing of each bit according to QAM before the data is modulated and re-

transmitted.

As per applicant's arguments concerning dependant claims, 2-7,12-15,17, 9-10,26 examiner maintains the rejection on them for the same reasons as their independent claims.

As per applicant's arguments (remarks page 11) of lack of motivation to combine Liu and Erreygers, examiner contends that providing more flexible transceivers (the adaptive data rate transceiver taught by Liu) in the ADSL repeater taught by Erreygers (as mentioned in the previous office action) is a valid motivation to combine the references.

As per applicant's arguments (remarks page 11) of lack of motivation to combine Liu and Erreygers and McGhee, examiner contends that the motivation specified in the prvious office action (and maintained) is a valid motivation because it increases network capacity and saves costs.
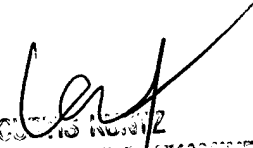
As per applicant's arguments (remarks page 16) of lack of motivation to combine Liu and Erreygers and Fisher examiner contends that the motivation specified in the previous office action (and maintained) is a valid motivation because it increases network capacity and saves space. Examiner maintains that Fisher teaches a well known circuit structure with an advantage inherent to resistors (space savings over alternate circuits such as inductors) that would obviously have been implemented as the unspecified hybrid function disclosed by Liu.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

AJ
January 18, 2006